is slightly observable. The Shan face is usually short, broad, and flat, with prominent malars, a faint obliquity and contraction of the outer angle of the eye, which is much more marked in the true Chinese. The nose is well formed, the bridge being prominent, almost aquiline, without that breadth and depression characteristic of the Burman feature. The lower jaw is broad and well developed; but pointed chins below heavy, protruding lips are not infrequent. Oval faces laterally compressed, with retreating foreheads, high cheek-bones, and sharp retreating chins, are not infrequent; and the majority of the higher classes seemed to be distinguished from the common people by more elongated oval faces and a decidedly Tartar type of countenance. The features of the women are proportionately broader and rounder than those of the men, but they are more finely chiselled, and wear a good-natured expression, while their large brown eyes are very scantily adorned with eyebrows and eyelashes. They become much wrinkled by age, and, judging from the numbers of old people, appear to be a long-lived race. They are by no means a tall people, the average height for men scarcely reaching five feet eight, while the women are shorter and more squat in figure.

A minute account of these people, their manners, customs, dress, &c., is given by Dr. Anderson. Some of the ornaments worn by the women are of most artistic workmanship.

The latter part of the volume contains a clear account of the second expedition undertaken to open a trade route between Burmah and China, but which, as we have said, came to an untimely and sad end about a year ago in the murder of Mr. A. R. Margary. Dr. Anderson sets forth the whole circumstances with evident fairness, and yet it is difficult to say exactly who was to blame in the matter. That such a trade-route as it was attempted to establish would be of great advantage to all concerned, there is no doubt; and no doubt also it only requires time to establish it. There is yet a very great deal to be learned both with regard to the natural history of that part of the world, and with regard to the several interesting races of people which form its population. Dr. Anderson's work is a valuable contribution to such a knowledge, and the clear and straightforward manner in which he writes adds greatly to the intrinsic interest of the information with which his pages teem. The illustrations of the country and the people are charming, and the two maps enable the reader to follow satisfactorily the footsteps of the explorers.

OUR BOOK SHELF

A Class-book of Chemistry. By Edward L. Youmans, M.D. (London: Henry S. King and Co., 1876.)

"THIS book is not designed as a manual for special chemical students. It aims to meet the wants of that considerable class, both in and out of school, who would like to know something of the science, but who are without the opportunity or the desire to pursue it in a thoroughly experimental way. Such a class-book as the present . . . . must be but a brief compendium of general principles and descriptions of the most important substances, and is not to be judged of by the fulness of its details." This extract from the author's preface sufficiently explains the objects which he has had in view in compiling the book before us. Certainly the work has no claims as a text-book for students; for the general reader we are afraid it will prove of little interest. Within the compass of about 350 pages we have an account of Gravity, Heat, Molecular Attraction, Electricity and Light, besides Chemistry proper. Surely the day has passed when this kind of thing could be tolerated in a book which professes to teach science. People cry out against the teaching of science as a regular part of educational discipline. It is all very well in its own place, they say, but the only true mental training is to be derived from a study of classics.

If boys and youths devote years to the careful study of ancient languages, they can scarcely fail to receive at least some benefit. If, on the other hand, they pass rapidly through a course of training (?) in science, with the aid perhaps, of such a book as that before us, they quickly forget what they have learned, and, so far as mental training is concerned, they had better have left science alone altogether. Our chief objection to the present work is that it seems calculated, probably unconsciously calculated, to further the delusion that science is a thing to be taken up in a leisure hour, but not a thing the study of which requires, while at the same time it increases, every activity of the mind. If the study of science is to be made a discipline, that study must not be pursued in the spirit of Dr. Youmans' book. The student must not content himself with a superficial knowledge of a few facts, nor even with gaining one or two generalisations; he must be taught to amass facts on the basis of his own observation, to separate the more important from the less important facts, to classify these facts and at last to rise to a generalisation which shall enable him to group together and so explain what had appeared to be isolated phenomena. Dr. Youmans' book can afford the student little help in such a process as this.

Of course it must be admitted that there is a large class of people who have neither leisure nor inclination to make science a study, but who are nevertheless desirous, and properly desirous, of knowing something of what science has done and of the way in which she has accomplished her work. Such people will, we are afraid, receive but little enlightenment from the work we are noticing. There is just sufficiency of detail to make the whole subject appear uninviting, but not enough to make the book valuable to the student. The mass of isolated facts is too great for the ordinary reader; he would soon, if not bewildered, become fatigued.

A book designed for the purposes stated in the preface to the present work requires to be written more from the standpoint of some central idea, round which is grouped together such a number of facts as may serve to illustrate and enforce that idea. The relation of the facts to the general theory and of the theory to the facts may then be made the means of inculcating a certain amount of true scientific training.

While we thus complain of the general scope of Dr. Youmans' book, we must give the author praise for the manner in which some parts of his work are written, more especially the chapter on theoretical chemistry. The chapters on descriptive chemistry are exceedingly meagre in details, but pretentious in the ground which they *appear* to cover. M. M. PATTISON MUIR

Injurious Insects of Michigan. By A. J. Cook, of the Michigan State Agricultural College. Fourth Report of State Board of Agriculture for 1874.

THIS useful and instructive pamphlet is to a great extent compiled from the writings of Messrs. Riley, Fitch, Le Baron, Walsh, Harris, Curtis, and Packard. It is illustrated by numerous woodcuts from the able pencil of the justly celebrated Prof. Riley, of Missouri. Its object is to enlighten farmers, gardeners, and fruit-growers of the State of Michigan, as to the general appearance, structure, and habits of noxious insects; at the same time suggesting means by which the increase of these pests to agriculture may be arrested. The "Colorado Beetle" and the "Grape Phylloxera" occupy a conspicuous place among these enemies of man.

The pamphlet winds up with a valuable hint to house-

keepers whose carpets are in danger from the attacks of the Clothes Moth. "Take a wet sheet or other cloth, lay it upon the carpet, and then run a hot flat-iron over it, so as to convert the water into steam, which permeates the carpet beneath and destroys the life of the inchoate moth."

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

Water-supply of the Metropolis

I HAVE no intention of entering into a controversy in your columns with my friend Dr. Frankland, but his letter in your impression of March 16 seems to require some reply.

When I made the remarks which are called in question by Dr. Frankland, I was careful to say that I might not unfairly be accused of having done so from interested motives, an admission of which no one who reads Dr. Frankland's letter can say that he has not taken the full advantage. I am not ashamed of my occupation, and am quite ready to admit another historical parallel afforded by Jack Cade, and confess that I, or those who have gone before me, "against the king, his crown, and dignity, have built a paper-mill." But, whether paper-manufacturers "in the exercise of what they call their rights" are polluters of streams or no, is a question into which I never entered, and is entirely beside the points which I raised.

These are in the main avoided by Dr. Frankland. The two Commissioners, a portion of whose report I criticised, and of whom it is as well to observe Dr. Frankland is one, recommend that the Thames and the Lea should be entirely abandoned as sources of supply for domestic use in London, and particularly refer to the Chalk in the neighbourhood of London, and not to the distant springs of the upper Thames as the future source of supply. In his letter to you Dr. Frankland states that "The Commissioners advise that the drinking water of London should continue to be derived from its present sources, but that it should be led away to its destination before it is mixed with the sewage of Oxford, Reading, Windsor, and other towns, and before it is fouled by the filthy discharges of paper-mills, and by other disgusting refuse." I presume that these two statements can be reconciled, but looking at the proposal that the water should be procured "within a moderate distance of London" the calculations as to the area of 849 square miles of Chalk and Upper Greensand within thirty miles of London, and looking at the enormous expense of conveying water more than thirty miles, I took that radius as representing the area out of which some district was to be placed under unnatural conditions with regard to its springs and streams, in order to supply our vast metropolis, which I am told it is contemptuous to term "overgrown." I never spoke of the fertile meadows of the Thames valley, about which Dr. Frankland makes merry, and I never intentionally alluded in the slightest degree to the main valley of the Thames, except to say that both below and above London there might be spots in it from which a limited supply of water might be pumped without much injury to the neighbouring property. My comments were intended to be confined to districts in which the proposal of the Commissioners could be carried out of sinking wells below the present spring-heads, and so constantly drawing upon them that there should be always a void below the level at which the drainage naturally escapes. If this does not mean the drying up of the streams by cutting away their natural sources of supply I shall be glad to know what it does mean.

If Dr. Frankland were as well acquainted as I am with the gravelly soil of some of the low meadows in Chalk districts, he would cease to be surprised at the possibility of their being converted into "arid wastes" by the abstraction of the water with which they are now charged up to within a very few feet of their surface. In the valley in which I live I have known the peaty soil above such gravel, even without the artificial abstraction of the moisture below, become during a dry summer sufficiently arid accidentally to catch fire and continue burning for days.

But then I am told that the wealthy City of London would be able and willing to pay for any damage it might inflict in procuring its water supply. I can only say that the word "compensation" does not occur in the Index to the Report of the Rivers Commissioners, and I have sought in vain for any allusion to it in the text. Perhaps Dr. Frankland is not aware that at the present time the state of the law is such that even when compensation has been provided for by Act of Parliament, it has been held to be inapplicable in the case of wells being dried, on the ground that an action will not lie in respect of the loss of underground water, and therefore that no statutable damage has been inflicted.

As to the prescription for increasing the supply of spring water in a Chalk district by lowering the level of the subterranean reservoir, I may observe that in most of such districts floods are almost unknown, the soil being sufficiently absorbent to imbibe all the rain that falls, except when by chance the surface is frozen. The lowering of the water which, except in the valleys, is now usually from 100 to 200 feet below the surface, would make no difference in the receptive power of the soil on the hills, and could not be effected in the valleys without laying the streams, which now flow through them, dry.

As to London encountering the expense of a separate water supply for dietetic purposes, I can only say that if it can be effected for 2,000,000*l.*, as suggested by Dr. Frankland, it will in my opinion be far cheaper than the plan the Commissioners advocate. It is as a rule more economical to make use of what we have, than to discard all existing appliances and commence on a new system. Perhaps the Water Companies may have a word to say on this point.

The concluding paragraph of Dr. Frankland's letter seems to have been written under some misapprehension. I distinctly stated that "if we refer to the headings of Organic Carbon and Organic Nitrogen there can be little doubt of the superiority of the Kent Company's water." I may, however, be under some misconception as to the statistics under the awful heading "Previous Sewage or Animal Contamination," in which, possibly, I do not stand alone. What I ventured to suggest was that the Commissioners on the Water Supply of the Metropolis, within whose proper sphere this question lay, were not altogether wrong in reporting, that with perfect filtration and efficient measures taken for excluding from the rivers the sewage and other polluting matter, the Thames and Lea would afford water which would be perfectly wholesome, and of suitable quality for the supply of the metropolis.

If this proved impossible, then I ventured to point out that there was already in London a sufficient supply of water of the kind recommended by the other body of Rivers Commissioners.

I must not, however, waste your space and your reader's time, but will in a few words mention my principal reason for taking up this subject, which, however, apart from any such reason, I considered would be of interest to geologists.

It was this, that in an otherwise admirable and exhaustive public report, measures were advocated involving in all probability great inconvenience and loss to large tracts of country, without, so far as I could see, one single reference to such loss and inconvenience. With the advocates of a private scheme such a disregard of injury to others would be reprehensible, though possibly not uncommon, but some greater consideration of the interests involved might fairly be expected from a public document.

JOHN EVANS

Nash Mills, Hemel Hempsted, March 18

Evidences of Ancient Glaciers in Central France

MANY lovers of natural history who have not the opportunity of seeing foreign scientific periodicals, may learn the advantage of taking such a paper as NATURE in the correspondence which was published between Dr. Hooker of Kew and the late Mr. Poulett Scrope, on the evidences of ancient glaciers in Central France.

The objections raised by Mr. Poulett Scrope, and the pleasure of examining such evidences as are adduced by Dr. Hooker, have induced me to accept the invitation of friends, who also enjoy such researches, to again visit Auvergne for the purpose of examining the Mont Dore valley for glacial traces, and I would gladly avail myself of any observations made by other geologists in that region, if they would do me the favour of sending me the notes of any localities to the address below.

In the meantime M. A. von Lasaulx, of Breslau University, claims the priority over Dr. Hooker in describing glacial traces in the *Ausland* periodical, in 1872, as occurring at the entrance of the "Gorge d'Enfer." I have also before me, as I write, a travelling note-book of Sir Wm. Guise, President of the Cotswold Naturalist Field Club (date, June, 1870), in which he refers